

# NORTH BEACH

## Water Quality Report Summer 2008



**North Beach, Hampton  
Water Quality Report  
Summer 2008**



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## History of the Beach Program

The New Hampshire Department of Environmental Services (DES) recognizes a public health threat may exist within recreational waters and tests the water at the state's beaches to ensure swimmers are not exposed to disease-causing pathogens or cyanobacteria scums. The DES has operated a Public Beach Inspection Program, commonly called the Beach Program, for over 20 years.

The New Hampshire coastal beach monitoring program was initiated in 1989 with the DES inspecting five beaches. In October 2000, the United States Congress amended the Clean Water Act to include the BEACH Act. The Environmental Protection Agency (EPA) could now was now authorized to award grants to eligible states to develop and implement monitoring and notification programs. These programs protect the public from exposure to pathogenic microorganisms in coastal recreation waters.

The DES first received grant funds in 2002. Since then the New Hampshire Beach Program has successfully met all of EPA's performance criteria requirements (*National Beach Guidance and Required Performance Criteria for Grants*) and continues to expand the monitoring and notification program. Weekly summer monitoring throughout the state was conducted at nine beaches in 2002, and has since doubled to 16 by 2008. The Beach program strives to expand sampling to include all coastal New Hampshire beaches.

Coastal beaches are monitored for the presence of the fecal bacteria *Enterococci* which are present in the intestines of warm-blooded animals including humans. Fecal bacteria, when present in high concentrations and ingested, can commonly cause gastrointestinal illnesses such as nausea, vomiting and diarrhea. These indicator organisms signify the possible presence of other potentially disease-causing organisms in the waterbody.

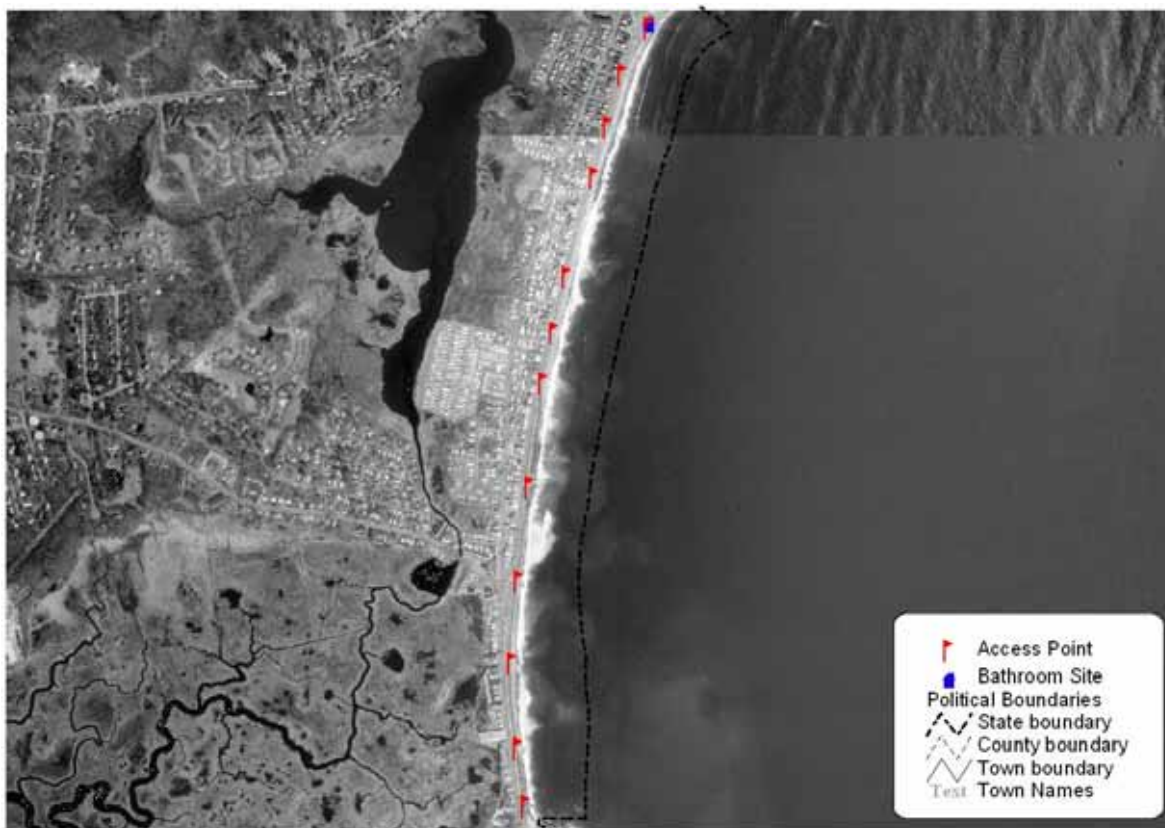
Beach monitoring and bacteria source tracking have been implemented to protect public health. In a collaborative effort, the DES Beach program, towns, beach managers, recreational directors and health inspectors encourage public awareness of sources of pollution and environmental responsibilities. Thank you for your interest and concern in New Hampshire's water quality.

## Beach Statistics

North Beach is owned and maintained by the New Hampshire Division of Parks and Recreation, State Parks Bureau. It is located in Hampton on Route 1A, just north of Great Boar's Head. The beach season operates from June 14 to September 1.

North Beach is a 7,525-foot long sandy beach, with some rocky areas at the southern end. The beach is used by the public for swimming, walking, and surfing, among other recreational activities. There are 12 access points to the beach area from the metered parking lots along Route 1A (Figure 1). There are lifeguards present throughout the beach season between the hours of 10:00 A.M. and 5:15 P.M., and toilet facilities are available year-round.

Waterfowl are frequently observed at the beach; the most commonly observed are gulls. There are restrictions for dogs at all State Park beaches, but dogs were observed on North Beach during seven different inspections this summer.



**Figure 1. North Beach Access Points and Restroom Facilities.**

## **Assessing Your Beach**

### **Sampling Frequency and Location**

The Beach Program developed a risk-based beach evaluation process and tiered monitoring approach during the 2003 beach season based on the EPA performance criteria. Beaches are evaluated annually to determine potential health threats to the public. Evaluations are based on several criteria within three main categories: beach history, microbial pathogen sources, and beach use. Beaches are now assessed as impaired for bacteria based on the most recent version of the Consolidated Assessment and Listing Methodology (CALM). The CALM assesses beach units as impaired based on historical exceedances of both the single sample and geometric mean bacteria standards. This report is submitted to EPA every two years.

Based on the evaluations, beaches are assigned a Tier I, Tier II, or Tier III status. Tier I beaches are considered “high priority” and have an increased potential to affect public health. Tier II beaches are “medium priority” and Tier III are “low priority” beaches that have less potential to affect public health. Beach sample frequency is based on Tier status; Tier I beaches are sampled twice per week, Tier II beaches are sampled once per week, and Tier III beaches are sampled every other week.

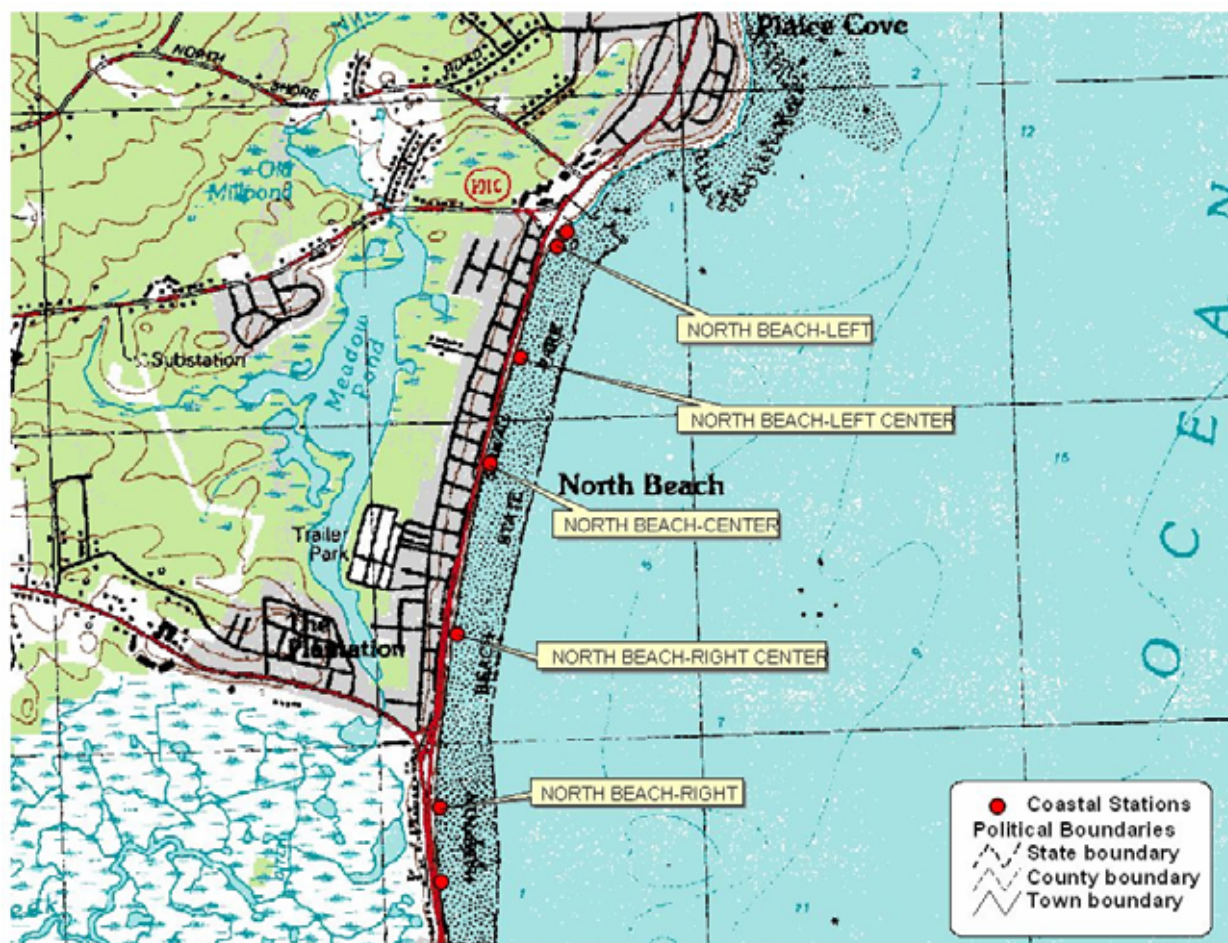
The number of samples collected at each beach is determined by the beach length. Beaches less than 100 feet in length are sampled at left and right locations one-third of the distance from either end of the beach. Beaches greater than 100 feet in length are bracketed into thirds and sampled at left, center and right locations. Routine sample collection may be enhanced by sampling known or suspected pollution sources to the beach area. Storm event sampling may be conducted at beaches where watershed runoff resulting from rainfall is expected to impact beach water quality.

North Beach is a Tier II beach indicating only a potential health risk, allowing for a weekly sampling. The frequency of sampling at North Beach has not changed since the launch of the beach evaluation process implemented in the 2003 sampling season. At North Beach, samples are collected at the left, left center, center, right center, and right stations regularly (Table 1). All stations are evenly distributed along the shoreline (Figure 2) and can be accessed via the parking area (Figure 1).



**Table 1. North Beach Station Descriptions and Latitude/Longitude Points.**

Station Description	Latitude	Longitude
<b>Left Sample Station:</b> Located in front of the bathrooms at the northern end of the beach.	42° 56' 25.5015"	-70° 47' 37.8188"
<b>Left Center Sample Station:</b> Located straight down from the access stairs directly across from 14 <sup>th</sup> street.	42° 56' 14.3000"	-70° 47' 43.1000"
<b>Center Sample Station:</b> Located straight down from the access stairs between 9 <sup>th</sup> and 10 <sup>th</sup> streets.	42° 56' 3.6165"	-70° 47' 47.3746"
<b>Right Center Sample Station:</b> Located straight down from the access stairs directly across from 6 <sup>th</sup> street.	42° 56' 14.4300"	-70° 47' 52.1400"
<b>Right Sample Station:</b> Located straight down from the beach entrance across from Row 11 at the south end of the beach.	42° 55' 29.0014"	-70° 47' 54.6526"



**Figure 2. North Beach Monitoring Stations.**

## **Coastal Water Quality Standards and 2008 Results**

Beaches are monitored to ensure compliance with State water quality standards. Marine waters are analyzed for the presence of the fecal bacteria *Enterococci*. *Enterococci* are known as indicator organisms, meaning their presence may indicate the presence of other pathogenic organisms. The State standard for *Enterococci* at public beaches is 104 counts/100 mL in one sample, or a geometric mean of 35 counts/100 mL in at least three samples collected over sixty days. When samples exceed the standard, a beach advisory is issued, at which point the beach manager is notified and signs are placed at the entrances to the beach to warn the public of the potential health threat posed by water contact at the beach. Beach advisories remain in effect until subsequent beach sampling indicates safe water quality conditions.

The 2008 sampling season began May 27th. The sampling season encompassed 96 days. Precipitation was recorded on 32 days over the summer (based on Seabrook Power Station recorded precipitation). June wetfall totaled 1.85 inches while July and August yielded 4.48 and 3.26 inches of rain respectively.

At North Beach, fourteen routine inspections were conducted during the 2008 beach season, with three additional inspections taking place in September. Eighty-five samples were collected and tested for *Enterococci* (Appendix B). Overall, the 2008 summer *Enterococci* levels were very low and within the State's standards for North Beach (Figure 3), with no advisories issued.

North Beach experienced elevated bacteria levels on only two occasions in 2008. On August 4, the left center sample had a result of 90 *Enterococci* counts/100 mL. The source of bacteria to this sample was apparently isolated, whereas the four other samples taken on August 4 did not contain elevated levels. The Beach Inspector observed seven dogs on the beach during the August 4 inspection, two of which were observed at the left center station. It is certainly feasible that dog waste in the water may have caused the high bacteria levels found in the left center sample.

The other instance in which high bacteria levels were noted at North Beach was on August 13, when the center sample contained 80 *Enterococci* counts/100 mL. It is possible that the 0.17 inches of rainfall in the 24 hours prior to sampling may have washed bacteria into the beach area. By the time the beach was re-sampled; all bacteria counts had decreased to within the state standards for designated beaches.



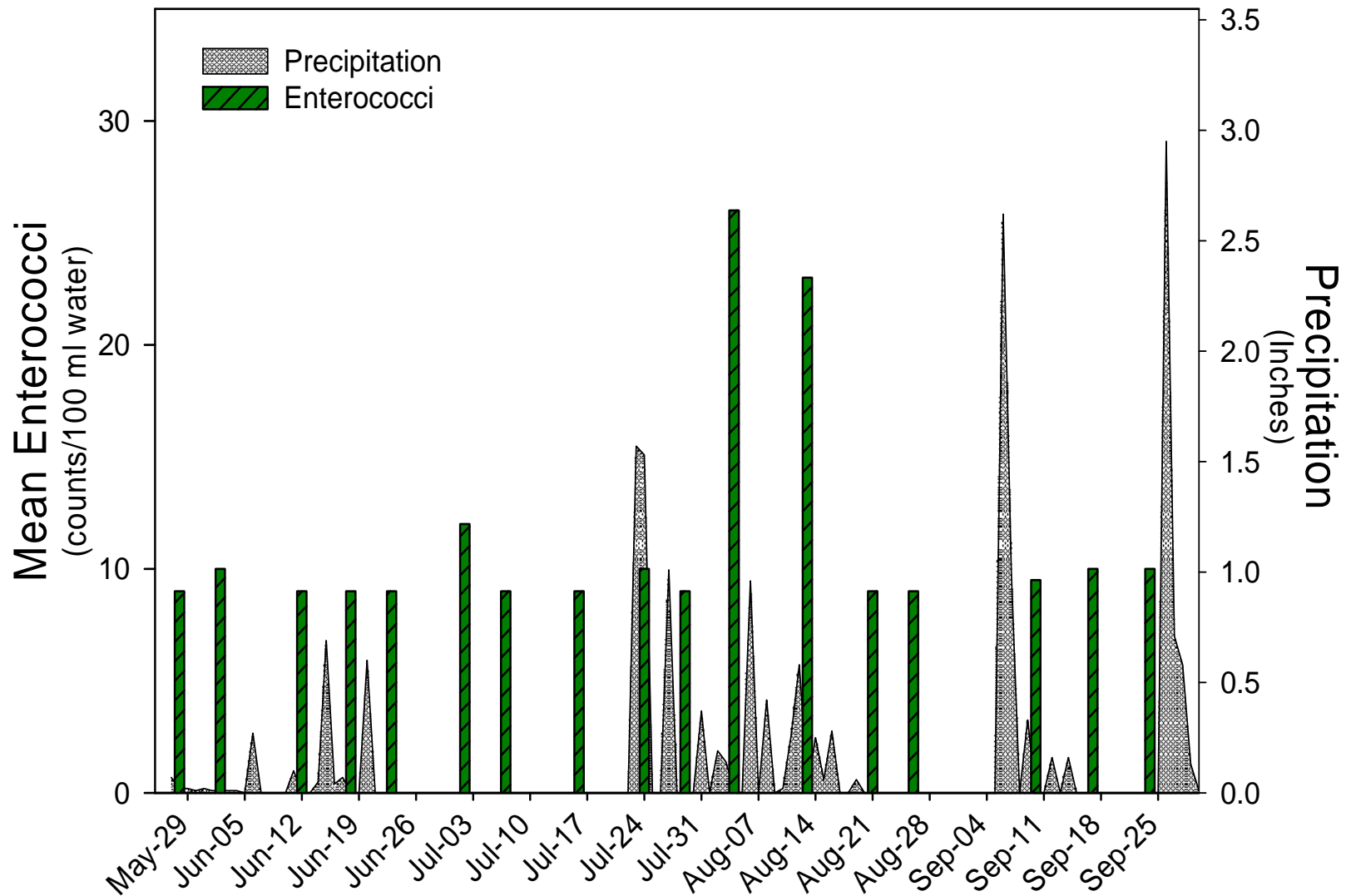


Figure 3. North Beach 2008 Enterococci Data. Enterococci values are the mean of the five collected beach samples. No advisories were posted at North Beach during the summer of 2008 for violations of the state standard of 104 counts/100 ml of water. Elevated July and September rainfall did not lead to increased bacteria values. See Appendix B for all results from all stations for the 2008 sampling season.

## **Off-Season Sampling**

The New Hampshire chapter of the international Surfrider Foundation has volunteered to monitor two beaches in the off season. The volunteers sampled North Beach and Jenness Beach weekly from March to late May and from October through November. The volunteers were trained according to DES protocol and took samples in the same manner as DES staff. All samples were returned the DES Laboratory in Concord for analysis.

At North Beach, all results were less than or equal to 10 Enterococci counts/100 ml of water except for those taken on April 13 and October 20. However, even the results for these days remained at or below 50 counts/100 mL, which is well below the state standard of 104 counts/100 mL. Additionally, the number of surfers was recorded. The average number of surfers observed during the spring was 6 and during the fall it was 10. A high of 45 surfers was observed at North Beach on November 9.

The partnership between the DES and the Surfrider Foundation began in the spring of 2007 and should continue as long as the Surfriders are able to provide volunteers to inspect the beaches. It is hoped that future off-season sampling will include New Castle Town Beach which has incurred the most advisory days in the past few years, with four advisories occurring in the last two summers.

## **North Beach Adopt-a-Beach Program**

In response to growing concern over the amount of litter and marine debris impacting visual and environmental aspects of New Hampshire's beaches, the Beach Program partnered with the Blue Ocean Society for Marine Protection from Portsmouth, N.H. Both parties met in the spring of 2005 to discuss the development of an Adopt-a-Beach Program. The Blue Ocean Society agreed to add North Beach to their Adopt-a-Beach Program and the Beach Program agreed to supply all necessary materials for adopting the beach.

Volunteers conduct beach clean-ups about once per month and record items found on data cards. The litter is discarded into trash bags and weighed at the end of the clean up. The items recorded on data cards are tallied and sent to the Blue Ocean Society where the numbers are entered into spreadsheets and summarized for the year. Ten clean-ups were conducted at North Beach in 2008. The most numerous items found were cigarettes butts, plastic and metal beverage containers, and fishing rope. The combined weight of trash collected was 374 pounds.

## Concerns

A total of sixteen dogs were observed on the beach during inspections this year, despite the fact that North Beach does not allow dogs in the beach area. The DES recommends that the animal prohibition be enforced. Not only do pet feces left on the beach pose a health threat to beach-goers, pet wastes may also increase the potential for beach advisories, as they are bacteria sources to swimming areas.

## Future Projects

- The DES Beach Program encourages participation between the State Parks Division, local businesses, or school groups and the Adopt-a-Beach Program. The program promotes beach clean-ups and water quality monitoring. The DES would conduct training sessions and participate in education and outreach activities for the community.
- The Division of State Parks may want to consider providing dog walkers with a pet waste station. The station distributes bags for dog walkers to collect the waste and also houses a trash receptacle to dispose of the waste.

For more information regarding Adopt-A-Beach or pet waste stations, please contact Sonya Carlson at (603) 271-0698 or [sonya.carlson@des.nh.gov](mailto:sonya.carlson@des.nh.gov).

## **Appendix A: 2008 Special Report – Stormwater Modeling**

When rain falls over the land, it flushes bacteria and other contaminants that have accumulated on the landscape to our beaches. As impervious areas like pavement and buildings are constructed in a subwatershed, more runoff contaminants are carried to our beaches. In addition to increased impervious cover as a result of land use changes, New Hampshire has recently experienced substantial and prolonged wetfall events. With increased flushing of the landscape combined with expanded impervious cover, it is imperative for local and state governments to explore new management techniques to protect New Hampshire beaches from contaminant sources.

DES Beach Program monitors New Hampshire coastal waters for potentially pathogenic bacteria. The DES has been monitoring these beaches since 1989 and has amassed large amounts of bacterial information for most coastal beaches. This collected information over the past years can be used to predict bacteria counts that can be expected with present and future development.

The DES Beach Program is proactive and always researching new management practices that can improve beach quality and new techniques to accelerate the beach advisory notification process. Beach Program personnel sample coastal beaches 4 days a week. Advisories are issued once state bacteria standards are exceeded. Despite our protective efforts, at least 24 hours pass from sample collection to bacteria count determination. During this time DES and swimmers are unaware of bacteria levels. The period of time between monitoring and sample analyses certainly put swimmers at risk for potential illness.

Two important Beach Program goals are to determine watershed contribution of bacteria to coastal beaches and to predict bacterial concentrations during and after a rain event. Mathematical models can be used to ascertain categories of bacteria sources and to predict bacteria concentrations after a rain event. Such models are complex and require a great deal of expertise and technical skill. The DES has selected FB Environmental to utilize an appropriate model and to train Beach Program personnel how to apply the model. With detailed predictions of how wetfall will affect bacteria transport to coastal beaches, future buildout planning, mediation, and construction could be guided by a stormwater model. The DES hopes the model will provide a useful tool for town officials and law makers to improve public notification and protect public health.

With the ability to predict public beach bacterial concentrations DES could immediately post an advisory based on predicted values and conduct follow up sampling for verification. A predictive model would allow advisories to be posted as soon as a public health threat occurs. Collecting samples during times of predicted high bacteria levels will help DES verify the accuracy and precision of the model. A model can be an effective tool in helping us achieve our mission to protect the public from exposure to waterborne illness while enjoying New Hampshire waters.

In addition to coastal bacteria data, the model will incorporate land use categories, hydrology, topography, historical precipitation records, historical tide data, and waste management. The data collection effort for this project has been time consuming and required help from several sources outside the DES. The DES would like to thank the National Oceanic and Atmospheric Association, the National Climatic Data Center, the Seabrook Nuclear Power Station and the Pease Air National Guard Base Weather Station for providing data. The model is only as good as the data we input, so we strive for the best quality controlled verified data available. The project is due for completion in early 2009.

## Appendix B: North Beach 2008 Data by Date

Date	Enterococci (count/100 mL)					Tide Height (feet)	Rainfall in previous 24 hours (inches)	Number of bathers	Animal Presence
	Left	Left Center	Center	Right Center	Right				
5/28/08	< 10	< 5	< 10	< 10	< 10	3.33	0.09	0	1 dog
6/2/08	< 10	< 10	10	< 10	< 10	8.57	0.01	0	0
6/12/08	< 10	< 10	< 5	< 10	< 10	6.4	0	6	0
6/18/08	5	< 10	< 10	10	< 10	5.33	0	11	3 birds
6/23/08	< 10	< 5	< 10	< 10	< 10	0.51	0	32	14 gulls
7/2/08	10	< 10	< 10	< 10	20	6.94	0	40	0
7/7/08	< 10	< 10	< 5	< 10	< 10	-0.46	0	11	5 gulls, 1 loon
7/16/08	< 5	< 10	< 10	< 10	< 10	6.22	0	62	5 gulls, 1 dog
7/24/08	< 10	< 10	< 10	< 10	< 10	0.86	2.18	10	5 gulls, 1 dog
7/29/08	5	< 10	< 10	< 10	< 10	8.5	0	14	0
8/4/08	10	90	< 10	10	10	0.78	0.01	16	10 gulls, 7 dogs, 5 pigeons
8/13/08	< 5	< 10	80	< 10	< 10	7.59	0.17	12	0
8/21/08	< 5	< 10	< 10	< 10	< 10	0.31	0	75	55 gulls, 5 dogs
8/26/08	< 5	< 10	< 10	< 10	< 10	7.18	0	10	3 gulls, 1 dog
9/10/08	< 10	< 10	< 10	< 10	< 10	3.34	0.33	0	5 gulls
9/17/08	< 10	< 10	< 10	< 10	< 10	8.71	0	12	1 gull
9/24/08	< 10	< 10	< 10	< 10	< 10	1.61	0	10	7 gulls, 3 dogs, 1 cormorant